

Supporting Material:**Condensation Prevails over B-A Transition in the Structure of DNA at Low Humidity**

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Supporting Material List

- Supplementary Materials and Methods.
- Fig. S1. Circular Dichroism characterization of linearized plasmids pBACgus11 and piJ702 in buffer-ethanol mixtures.
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SUPPLEMENTARY MATERIALS AND METHODS

Circular dichroism characterization of DNA

We used circular dichroism (CD) to characterize the different DNA base-stacking conformations and its cooperative transitions (1). Figure S1 in this document shows the CD analysis for pBACgus11 and piJ702 plasmids in buffer-ethanol mixtures. In agreement with former literature (2-4), measurements of pBACgus11 (48% G·C) showed characteristic B-DNA CD spectra in both buffer and buffer-ethanol mixtures below 70% ethanol concentration. At ethanol concentrations above 80% a characteristic A-DNA CD signal was present. Also, as previously reported (5), we confirmed that the presence of spermine favors this transition with lower ethanol concentrations. Linearized piJ702 DNA (70% G·C) showed A-form CD spectra in aqueous solution and in buffer-ethanol mixtures due to its high content of G·C basepairs (see main text and (6)).

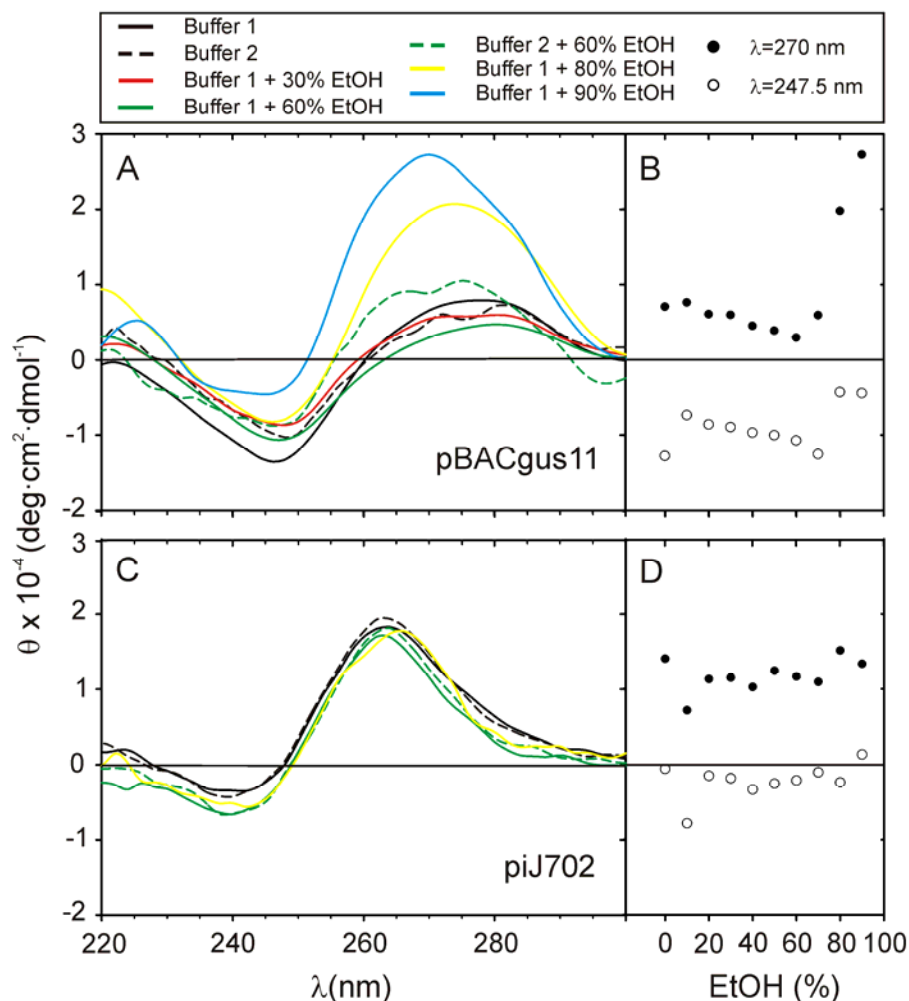


FIGURE S1 Circular Dichroism (CD) characterization of the two linearized DNA substrates. Left graphs shows normalized CD spectra (molar ellipticity per residue) of (A) pBACgus11 (concentration, $(0.4 - 0.9) \times 10^{-4}$ M DNA residue) and (C) piJ702 (concentration, $(0.8 - 1.4) \times 10^{-4}$ M DNA residue) in different solutions. Solid black lines, DNA in 1 mM NaCl TE buffer (buffer 1); dashed black lines, DNA in 1 mM NaCl TE buffer with 17.5 μ M spermine (buffer 2). Rest of the curves, DNA in mixtures of 1 mM NaCl TE buffer with ethanol at concentrations of 30% (solid red), 60% (solid green), 60% and 7 μ M spermine (dashed green), 80% (solid yellow) and 90% (solid blue). Right graphs shows the CD signal dependence in molar ellipticity per residue on the ethanol concentration for (B) pBACgus11 and (D) piJ702 at 270 nm (●) and 247.5 nm (○).

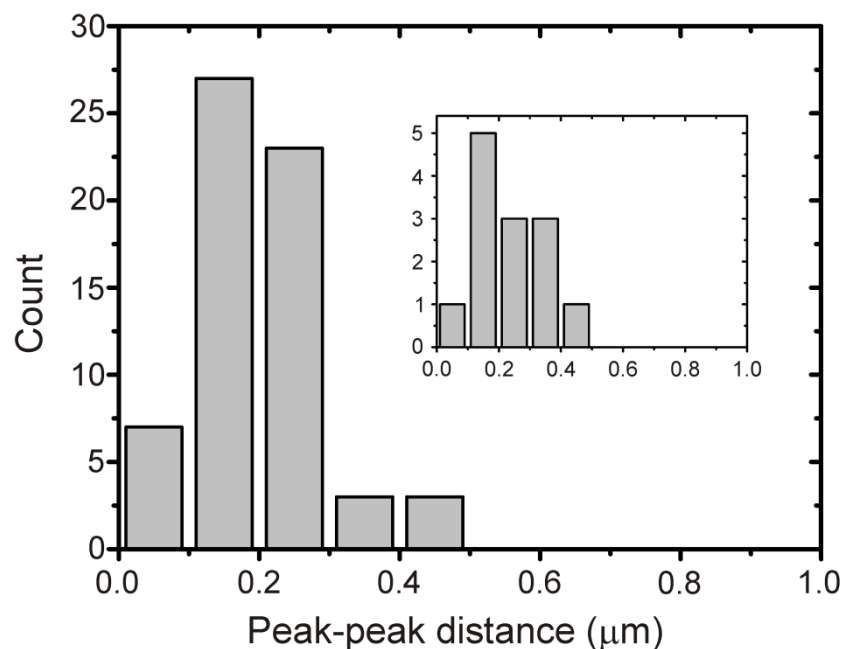


FIGURE S2 Histogram of the distance between force peaks during extension of individual dsDNA molecules. We measured the peak-peak distance for stick-release response in piJ702 plasmid for low (1 mM NaCl) and high (80 mM NaCl) salt TE buffer mixed with 80% and 90% ethanol. We counted 63 peak-peak distances for 27 stick-release curves. Inset: Histogram of the distance between force peaks during extension for piJ702 in 60% ethanol mixed with 1 mM NaCl TE buffer in the presence of 7 μ M spermine (13 peak-peak distances of 7 stick-release curves). In all conditions the most probable interval for peak-peak distance is in the range of 150 to 250 nm.

SUPPORTING REFERENCES

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